Toward a 60-Minute Diagnosis

Portable, DNA-based devices are being designed that will identify naturally occurring or deliberately released disease organisms in under an hour—instead of taking days or weeks, as today's methods require. Their adoption would allow extension agents or consultants to make on-site, real-time recommendations on how best to curtail a crop disease outbreak before it spreads. The devices would also be useful in checking imported perishable plant materials for hidden plant disease organisms that could imperil domestic crops.

Expertise in bacterial, fungal, and viral genetics enables scientists to design primers and probes to target the specific DNA sequences of several major plant pathogens. A primer binds with a pathogen's DNA and prepares it for polymerase chain reaction amplification on the testing unit. The amplified DNA then binds with the probe and emits a fluorescent signal that can be measured and displayed on a computer.

The researchers are collaborating with Cepheid of Sunnyvale, California, to test this innovative technique for detecting bacterial wilt (brown rot) and ring rot of potato, citrus canker, Karnal bunt, Pierce's disease, citrus variegated chlorosis, plum pox, soybean rust, watermelon fruit blotch, and other emerging plant diseases. *Norman W. Schaad and Reid Frederick, USDA-ARS Exotic Diseases-Weed Science Research Unit, Fort Detrick, Maryland; phone (301) 619-2847 [Schaad], (301) 619-7386 [Frederick], e-mail schaad@ncifcrf.gov, frederir@ncifcrf.gov.*

Everything You Want To Know About Bees

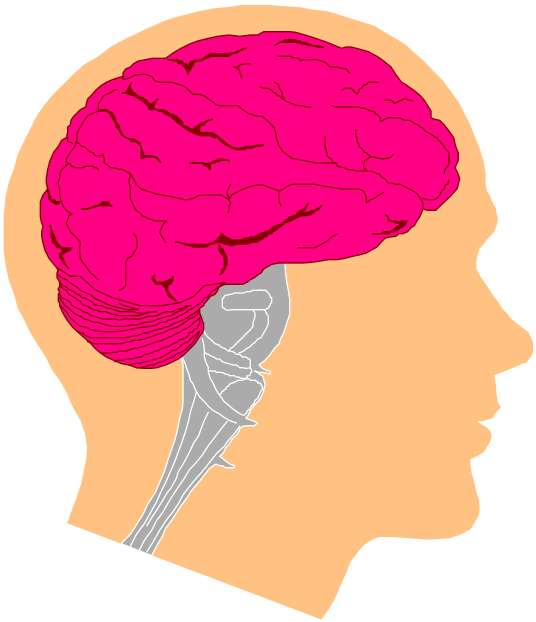
A new Internet service is providing answers to wide-ranging questions about honey bees—free of charge. Called the Expert Forum on Honey Bees, it lists a wide range of frequently asked questions, along with answers from scientists. It also provides information about beekeeping as a hobby or profession, crop pollination, honey bee biology, and related research. And the site maintains a Student Forum on Honey Bees, with questions and answers for students in grades K through 12.

Users will play a key role in expanding this state-of-the-art, electronic question-and-answer service. As new questions are received and answered, the staff will update the forum, which can be accessed 24 hours a day, 7 days a week, by going to http://gears.tucson.ars.ag.gov. *Gloria DeGrandi-Hoffman, USDA-ARS Carl Hayden Bee Research Center, Tucson, Arizona; phone (520) 670-6481, e-mail gdhoff@aol.com.*

Iron and Zinc Keep Brains in the Pink

Mental performance tests may be a simple way to detect shortages in dietary iron or zinc—well before other signs of deficiency might show up in blood or urine.

A study of 27- to 47-year-old men found that a low attention span corresponded with a subsequent decline in iron levels in the body. A similar change in ability to focus occurred in a study with obese but otherwise healthy women. These were the first studies in healthy adults to link decreased body iron levels with lowered attention span. And when the male volunteers followed a low-zinc regimen, their ability to recall simple words slowed. Those with the greatest decrease in blood levels of zinc slowed the most. *Mary J. Kretsch, USDA-ARS Western Human Nutrition Research Center, Davis, California; phone (530) 752-4171, e-mail mkretsch@whnrc.usda.gov.*



Beyond Bread and Beer—Another Use for Baker's Yeast

Though a mainstay ingredient in bakeries and breweries, common baker's yeast has potential uses far beyond these familiar products. Scientists have learned to change the metabolism of *Saccharomyces cerevisiae* by adding certain plant enzymes so that it can convert vegetable oils into more valuable byproducts.

Baker's yeast depends on sugars and other carbohydrates for most of the fermentative activity that produces the carbon dioxide and alcohol that bakers and brewers need. It mainly uses lipids to reinforce cell walls and store energy.

But the modified yeast can store up to seven times the normal amount of lipids. And by adding different enzymes under different conditions, researchers have enabled the yeast to convert oilseed crops such as soybeans, cotton, and linseed into products such as alpha eleostearic acid—the main ingredient of tung oil—and alpha linolenic acid, which contains an omega 3 fatty acid shown to protect against heart disease and cancer. Further refinement of the procedures should allow for larger scale production of these and other valuable lipids. *John M. Dyer, USDA-ARS Commodity Utilization Research Unit, New Orleans, Louisiana; phone (504) 286-4351, e-mail jdyer@srrc.ars.usda.gov.*